Geetika Vadali

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Research Interests

Deep Learning, Computer Vision, Computational Neuroscience, Reinforcement Learning

Education

- **Georgia Institute of Technology**
  Master of Science in Computer Science - Thesis Track *Aug. 2025 – Dec. 2026*
  Computer Vision (A), Deep Learning (A), Machine Learning (A), Autonomous Robotics (A), Introduction to Graduate Algorithms*, ML for Neural/Behavioral Data*
  Grade: **4.00/4.00**

- **Indira Gandhi Delhi Technical University for Women** Delhi, India
  BTech in Computer Science and Engineering with Artificial Intelligence *Aug. 2021 – May 2025*
  Grade: **9.25/10.00**

Research and Industrial Experience

- **Graduate Researcher**: BRAINML Lab, Georgia Institute of Technology advised by Prof. Anqi Wu
  April 2026 - Currently
  - Developing a pipeline that recovers an agent's hidden reward function from behaviour alone when the agent has only partial, egocentric observations (POMDP): perception, belief state, latent MDP, then inverse reinforcement learning to recover the agent's motivation.

- **Graduate Researcher**: Georgia Institute of Technology advised by Prof. Cedric Paradalier
  August 2025 - Currently
  - Built a robust data pipeline for terahertz reflectivity scans of paper with four ink types, including single-layer and multi-layer samples, and released the dataset (Data in Brief, 2026).
  - Trained and compared 1D and 3D CNNs for multi-class ink classification, using co-teaching for robustness to noisy labels. Selected models through a systematic grid search, with quantitative and qualitative error analysis reaching state-of-the-art results.

- **Machine Learning Intern**: Aurva, Bengaluru
  April 2025 - July 2025
  - Tested various SOTA LLMs on data-security domain specific question-answering and compliance report generation. Employed techniques like Retrieval Augmented Generation and Prompt Engineering to handle complex and large API responses and extract the desirable context.

- **Mitacs Globalink Research Intern**: Northern Institute for Deep Learning in Ultrasound Lab, University of Alberta, Edmonton, Canada advised by Prof. Abhilash R. Hareendranathan
  May 2024 - August 2024
  - Trained a deep reinforcement learning agent to select informative frames from shoulder ultrasound videos, designing the reward function and training pipeline. A classifier using the RL-generated summary reached 85.0% accuracy (90.0% sensitivity, 80.0% specificity) on 100 patients, versus 82.5% on full videos, and cut training time by 50% (8 to 4 hours).
  - Extended the approach to fracture detection in pediatric wrist ultrasound achieving similarly significant improvement in accuracy relative to training time. This led to two peer-reviewed papers (ISBI 2025 as co-first author, EMBC 2025).

Selected Publications

- **Terahertz reflectivity dataset: Reading text on both sides of the page**: Link
  Geetika Vadali, Hugo Cherid, Erwan Émile, Haolian Shi, Leor Jacobi, DS Citrin, Cédric Pradalier, Alexandre Locquet
  Data in Brief Journal August 2026, Elsevier

- **Shoulder Rotator Cuff Tear Detection from Ultrasound Videos using Deep Reinforcement Learning**: Link
  Shrimanti Ghosh*, **Geetika Vadali***, Ayush Singh, Yuyue Zhou, Banafshe Felfeliyan, Assefa Wahd, Jessica Knight, Mahesh R. Panicker, Jacob L. Jaremko, Abhilash R. Hareendranathan
  International Symposium on Biomedical Imaging (ISBI) 2025, Houston TX, United States

- **Video Summarization and Fracture Detection in Pediatric Wrist Ultrasound Using Deep Reinforcement Learning**: Link

  Shrimanti Ghosh, **Geetika Vadali**, Yuyue Zhou, Ayush Singh, Jessica Knight, Christopher Keen, Mahesh R. Panicker, Abhilash R. Hareendranathan, Jacob Jaremko

  IEEE Engineering in Medicine and Biology (EMBC) 2025, Copenhagen, Denmark

- **Spatio-Temporal Crime Detection Using Surveillance Videos in a Federated Setting**: Link

  Nikita Shrivastava*, Anushka Garg*, **Geetika Vadali***, Ritika Kumari

  International Conference on Computer Vision and Robotics (CVR) 2025, NIT Goa, India

- **Convergence to Nash Equilibrium: A Comparative Study of Rock-Paper-Scissors Algorithms**: Link

  Geetika Vadali*, M Deekshitha Reddy*, Ritu Rani, Poonam Bansal

  IEEE International Conference on Computing, Communication, and Intelligent Systems 2023, Noida, India Code Paper

Teaching Experience

- **Teaching Assistant**: Computational Neuroscience Summer School 2026, Neuromatch
  July 2026
  - Mentored a group of 17 students through the summer school's computational neuroscience content and projects, helping them with collaborative studying, modelling and programming, and with presenting their results.

- **Graduate Teaching Assistant**: Georgia Institute of Technology, Metz, France
  January 2026 - July 2026
  - Graduate Tutor for assistance and mentoring in CS 3600: Introduction to Artificial Intelligence, CS 3251: Computer Networking I, and other undergraduate CS courses without dedicated teaching assistants.

Technical Skills

- **Technical Languages**: Python, Java, SQL, C++, ROS2
- **Frameworks and Tools**: Tensorflow, PyTorch, Keras, Bootstrap, Pandas, Numpy, Tableau, Matplotlib, Scikit-Learn, Sympy, CI/CD, Bash Scripting

References

- **Prof. Cedric Pradalier**: Associate Professor, Department of Interactive Computing, Georgia Institute of Technology
  cedric.pradalier@gatech.edu
- **Prof. Abhilash R. Hareendranathan**: Assistant Professor, Department of Radiology, University of Alberta, Canada
  hareendr@ualberta.ca
- **Prof. Anqi Wu**: Assistant Professor, School of Computational Science and Engineering, Georgia Insitute of Technology
  anqiwu@gatech.edu